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Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

RESPONSES TO COMMENTS ON THE TASKS 4 AND 5 PRE-FINAL DESIGN PACKAGE

Reference: 1) Letter from J. Saric to J. Reising, "Task 4 and 5 Pre-Final Design Package," dated March 28, 1997.

2) Letter from T. Schneider to J. Reising, "DOE FEMP Task 4 Approval, Task 5 Approval Withheld Aquifer Restoration Project," dated April 3, 1997.

This letter transmits the Responses to Comments on the Aquifer Restoration Task 4 (Injection Demonstration Project) and Task 5 (South Plume Optimization Project) Pre-Final Design package. These responses were informally transmitted on April 18, 1997, for review and discussed on April 22, 1997. Additional modifications were made to the responses and informally transmitted a second time on April 25, 1997, and discussed on April 29, 1997.

The discussions held on April 29, 1997, centered on Task 5, South Plume Optimization, addressing concerns of the contingency planning for Well 3N. As discussed, the contingency planning for Well 3N includes installation of all underground piping and electrical from the South Plume Valve House to a location slightly north of Well 1N (essentially the northern extent of the easement being purchased at this time). This additional piping and electrical will permit faster reaction time to install Well 3N, if required, by combining portions of its construction with the current system. The additional piping could also potentially be used to re-route the flow from 2N north, along with Wells 1N and

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3N, if technically necessary in the future to isolate the system from the South Plume Removal Action discharge pipeline. However, as discussed, this situation would require negotiating additional easements with the affected property owner.

Based upon the verbal approval previously obtained from the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) on the draft responses, Certified for Construction Specifications and Drawings are being completed at this time for construction procurement.

If you have any questions regarding this document, please contact John Kappa at (513) 648-3149, or Robert Janke at (513) 648-3124.

Sincerely,

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Kappa

Enclosure: As Stated

cc w/enc:

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DRAFT RESPONSES TO U.S. EPA COMMENTS ON THE REMEDIAL DESIGN, PRE-FINAL DESIGN PACKAGE FOR TASK 4: INJECTION DEMONSTRATION AND TASK 5: SOUTH PLUME OPTIMIZATION

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

APRIL 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

DRAFT RESPONSES TO U.S. EPA COMMENTS ON THE REMEDIAL DESIGN, PRE-FINAL DESIGN PACKAGE FOR TASK 4: INJECTION DEMONSTRATION AND TASK 5: SOUTH PLUME OPTIMIZATION

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section#: Drawings Pg.#: NA Line#: NA Code:
Original General Comment# 1

Comment: The drawing numbering system is confusing. The drawings appear to be out of order, and some drawings are missing. It is difficult to follow the drawing numbers. Also, the sheet numbering system appears to arrange the drawings in some order; however, two drawings each have the same sheet numbers (N0004 and N0005). The drawing and sheet numbering systems should be revised so that they are easy to understand.

Response: The purpose of the drawing number is to provide a unique identifier for each drawing for easy withdrawal from the CADD and document control systems. The sheet numbers are the mechanism for arranging the design package into a logical order for ease of use. Part of this design package includes tieing into the South Field Extraction System (SFES) communication network and as such, these tie-ins are best detailed by modification of the drawings from that project's design package. This leads to the repeated sheet numbers (N0004 and N0005). To alleviate confusion these drawings were placed at the end of the design package as shown in the drawing index.

Action: The drawings from the SFES design package will include additional annotation on the scope of work to be performed by the Injection Demonstration (ID) construction contractor.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: Drawings Pg.#: NA Line#: NA Code:
Original General Comment# 2

Comment: The electrical symbol legend abbreviations and notes are missing from this set of drawings. The drawings should be revised to include electrical symbol legend abbreviations and notes.

Response: The drawings should have been provided.

Action: Drawings showing electrical symbols and legend will be added to the design package.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: Drawings Pg.#: NA Line#: NA Code:
Original General Comment# 3

Comment: All drawings should be revised to include proper graphic scales.

Response: All drawings have graphic scales on the bottom of the title block area. The drawings provided are half scale drawings, however construction bidders will be provided full scale drawings. The review drawings were provided at half-scale for ease of handling and mailing.

Action: The graphic scales will be verified.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: Drawings Pg.#: NA Line#: NA Code:
Original General Comment# 4

Comment: The pipeline profiles shown in the civil drawings should clearly indicate pipeline invert elevations at each point of change in slope. The profiles indicate a minimum soil cover of 3.5 feet; however, in many cases, the pipeline is shown with 6 feet of soil cover. If specific information such as invert elevations is not shown, the contractor will install the pipeline with 3.5 feet of soil cover. Invert elevations should be added to the profiles at each change in slope.

Response: The South Plume Optimization (SPO) and Injection Demonstration (ID) systems are pressurized systems. In a pressurized system maintaining strict control of elevations is not a critical issue. The design specifies slopes to aid in the assurance of air removal via the air release mechanisms to be installed in the system. In areas where coverage and elevations are critical additional inverts and stations will be added. Also, pipe slopes will be indicated on profiles to ensure continuous upward gradients toward air releases.

Action: Additional inverts, stations and slope arrows will be added at key points in the design.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: Drawings Pg.#: NA Line#: NA Code:
Original General Comment# 5

Comment: The number of air release valves on the pipelines appears to be inadequate; however, this cannot be determined because the profiles show multiple pipelines in the same trench and some of the pipelines appear to change elevations in order to miss branch connections. Dipping pipelines under branch connections may require additional air release valves because some pipeline sections may have isolated high points. The profiles should be revised to show all required air release valves. In addition, the profiles should be revised to show all manhole locations and changes in pipeline diameter, along with proper station numbers.

Response: Design will be changed to indicate that branch connections are to be made by rolling a mainline tie up or down to allow the branch main to pass over or under the adjacent mainline. This will eliminate need to add air release valves and will allow all mainlines to be installed at the same bottom elevation with no changes in elevation.

Action: Review mainline profiles to eliminate drops at branch connections and add detail for rolled tie branch connections.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: Drawings Pg.#: NA Line#: NA Code:
Original General Comment# 6

Comment: It is not clear why some drawings that show work "by others" are included in this set of drawings. The drawings should clearly show all work to be conducted under this construction contract. All other drawings should either be deleted or marked "for reference only."

Response: The drawings which show work "by others" are maintained within the package for continuity of information throughout construction and operation. This information is useful to the construction contractor to aid them in seeing the interrelation of their work to the big picture. During operations this information provided will provide a consolidated design package for the system.

Action: No action required.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-X00411 Line#: NA Code:
Original Specific Comment# 1

Comment: The drawing titles and sheet numbers used are very confusing. Sixteen drawings are numbered G0001 through G0016; however, the drawing titles refer to "Sheet No. 1 of 6," "Sheet No. 1 of 2," and so forth. It also appears that the sheets are out of order. It is not clear why two drawings each have the same sheet number (N0004 and N0005). Similarly, instrumentation drawings (Sheets No. N0008, N0009, and N0010) refer to "Sheet 1," "Sheet 2," and "Sheet 3" in their titles. All drawings should be numbered in sequence and referred to accordingly.

Response: See general comment response 1. The sheet numbers in the drawing title aids the construction workers in knowing that there are additional sheets of that type located within the package. Many times during construction the workers in the field will not have the entire drawing package with them. This information in the drawing title provides them a useful tool to inform them that additional information is provided elsewhere. The sheets are placed within the order given due to the anticipated construction progression. The grading/utility plans are placed within the plans and profiles due to commonality of geographic location for the work.

Action: The drawing titles will be revised to list "Drawing Title, 1 of 2" etc. (i.e., reference to "Sheet" in the drawing title will be deleted).

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00393 Line#: NA Code:
Original Specific Comment# 2

Comment: General Comment #6 applies here and should be addressed. In addition, the area showing the 50,000-gallon injection water supply tank and pumps is too small to read. This drawing should be deleted from the set.

Response: See general comment 6 response. The tank area is shown enlarged on drawing number 95X-5900-G-00401, Sheet number G0010.

Action: No action required.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00394 Line#: NA Code:
Original Specific Comment# 3

Comment: General Comment #6 applies here and should be addressed.

Response: See general comment 6 response.

Action: No action required.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00396 Line#: NA Code:
Original Specific Comment# 4

Comment: General Comment #4 applies here and should be addressed. In addition, the profile shown in Drawing No. 95X-5900-G-00452 indicates that the future grade is "by others" and that the pipelines are to be backfilled to the existing grade, which in many places is 6 feet higher than the future grade. Also, the tops of the air release manholes shown in Drawing No. 95X-5900-G-00452 will be buried if the pipelines are backfilled to the existing grade. All manholes should be extended up to "existing grade."

6

Response: See general comment 4 response. All manholes in this area will be extended up to "existing grade".

Action: Extend manholes in this area up to "existing grade".

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00397 Line#: NA Code:
Original Specific Comment# 5

Comment: General Comment #4 applies here and should be addressed. In addition, the two culverts shown in this profile do not agree with the invert elevations listed in the table in Drawing No. 95X-5900-G-00451. This drawing and the table in Drawing No. 95X-5900-G-00451 should be revised to be consistent. These culverts should also be shown with a dashed line because they are not crossed by the pipeline.

Response: See general comment 4 response. The pipeline does not cross the culverts, therefore, an elevation could not be assigned on the profiles. The notes indicating the location of the culverts on the profile will remain but the culvert will be deleted from the profile.

Action: Delete the culverts from the profile.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00399 Line#: NA Code:
Original Specific Comment# 6

Comment: General Comment #4 applies here and should be addressed. Also, an additional air release valve is apparently required near Point GW21 because this is a high point and the pipeline to Well No. 10 is only 4 inches in diameter. Finally, the reasons for the changes in slope of this pipeline should be explained.

Response: See general comment 4 response. An air release valve exists at well number 10 which is located near point GW21. This air release will service the high point shown there. The 8" x 8" x 4" tee will be turned up to allow air collected in the high point to escape to the well release valve. The change in the slope of the line is caused by following existing grade therefore minimizing construction costs.

Action: Indicate 8" x 8" x 4" tee with 4" takeoff turned upward on drawing 95X-5900-G-00399.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00400 Line#: NA Code:
Original Specific Comment# 7

Comment: General Comment #4 applies here and should be addressed. In addition, an air release valve will apparently be required where the pipelines run under existing GW-20" near the new valve house. The drawing should be corrected accordingly.

Response: See general comment 4 response. There are air release valves in the valve house for each line. The profile will be revised to eliminate the sag and force the air up these air vents. While this will require additional excavation, it will eliminate the need for three (3) air releases. A line will slope upward from well RW#7 (1) and from well RW#6 (2N) to the valve house. A third line (for future contingency well 3N) will also slope upward from RW#7 to the valve house but will not be tied in at either location. It's our engineering opinion that with this configuration an air release will not be required where the lines run under existing GW-20.

Action: Change profile accordingly. Note - this drawing will also be changed to reflect latest well location agreements.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00405 Line#: NA Code:
Original Specific Comment# 8

Comment: Air release manhole detail No. 1 shown in this drawing indicates that the manhole is

approximately 54 inches in diameter. If a 6-inch-diameter pipeline is installed as is shown with the check and gate valves, no space will be left for the fittings and pipe supports shown in this drawing. All details on this drawing should be checked and revised to ensure adequate working room and height in each of the manholes shown.

Response: The dimensions were verified and concluded that there is adequate room for the construction. The dimensions (in inches) are as follows:

Wall to face of flange	4
Wn flange	3.5
Spool	6
Wn flange	3.5
Wafer check valve	5.5
Gate valve	10.5
Wn flange	3.5
Spool	6
Wn flange	3.5
Face of flange to wall	4 (as needed to complete ID)
Total	50

Action: Details will be noted - Not to Scale.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-G-00452 Line#: NA Code:
Original Specific Comment# 9

Comment: This drawing shows profiles of multiple pipelines. It is not standard practice to show multiple pipelines in a single profile, especially when some pipelines change slope often and are only shown in partial views. Each pipeline should be shown in a separate profile. In addition, General Comment #4 applies here and should be addressed. Also, air release manholes No. 3 and 4 will be below ground because the future final grade is not covered under this contract. The air release manholes need to be extended to existing grade. See other comments for Drawing No. 95X-5900-G-00396. This drawing should be corrected accordingly.

Response: See general comment 4 response. When pipelines are buried in a common trench it is appropriate to show those pipelines in a common profile. Any deviations from the common trench are shown as needed. The air release manholes will be extended to existing grade.

Action: The drawing will be revised to show the air release manholes extended to existing grade.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-P-00418 and 95X-5900-P-00420 Line#: NA Code:
Original Specific Comment# 10

Comment: These drawings indicate that the injection water pumps, piping, valves, and 50,000-gallon storage tank will be installed outside. It is not clear why this equipment is not installed in a building similar to the building housing the valves (see Drawing No. 95X-5900-P-00453). The piping and pump will be exposed to freezing temperatures, and it is very difficult to insulate and heat-trace the pumps and valves. If the power fails during a winter storm, the system will freeze. The entire system can be installed in a below-ground vault using in-line type pumps. An explanation of why this system is outdoors and how it will be protected from freezing in case of a lengthy power outage should be provided. Also, the need for the 50,000-gallon tank should be made clear. The tank provides a water supply of less than 1 hour of pumping. If a power outage occurs, the water supply to the tank, as well as the injection system, will be out of service. The drawing should also shown how the water tank will be protected from freezing. Finally, because this is an aboveground

installation, an air release valve is required at the high point. The drawing should be revised to show all required valves.

Response: It is common practice to place tanks, piping, pumps of this size outside and heat trace them for freeze protection. A building large enough to house this area would greatly increase the cost of the project. In the event of an extended power failure, operators will drain the lines and the tank as necessary to prevent freeze damage. This strategy is the same strategy which is applied at the AWWT facility. The purpose of the 50,000 gallon tank is to hydraulically isolate the ID system from the rest of the groundwater remediation network and also to provide a limited surge capacity. In the event of an extended shutdown of the AWWT Expansion system (provides source water for the ID system) the ID system would also be shut down. This tank would provide for short term interruptions in the AWWT Expansion effluent flow such as during filling of Tank 297 (AWWT Expansion backwash supply tank) from the AWWT Expansion effluent. An air release valve will be added at the high point on the above ground piping.

Action: Add air release valve to drawing 95X-5900-P-00418.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-P-00419 Line#: NA Code:
Original Specific Comment# 11

Comment: This drawing shows an outside, aboveground piping installation that will be exposed to weather. The piping installation has small-diameter piping that may freeze during a power outage when the heat tracing is off. Similar installations are generally installed in underground vaults where they are protected from the elements. An explanation of why the system is outdoors and how it will be protected from freezing in case of a power outage should be provided. This drawing also indicates that the well casing is to be installed "by others," but it is not clear if the well screen is to be installed "by others." The drawing should be corrected to indicate who will supply and install the well screen.

In addition, detail No. 1 shows openings required in the 8-inch diameter steel flange. Either the detail needs to be modified or a larger well is required because it is very difficult to cut two 3-3/4-inch-diameter openings on the same centerline and one 2-5/8inch-diameter opening below an 8-inch-diameter flange. Finally, the steel-to-polyvinyl chloride pipe adapters on the lines inside the i-inch-diameter well each have an outer diameter of approximately 4.4 inches. This drawing should be revised to permit construction of the detail.

Response: During an extended power outage, operators will drain the above ground lines to prevent freeze damage. Site experience has proven that below grade installations are much harder to maintain and operate due to access requirements and accessibility. The well screen will be installed by others and the drawing will be revised to clarify that information. The downcomer piping for injection well 8 will be modified to include only one 3" downcomer to aid in construction.

Action: The drawing will be revised to clarify that the well screen is by others and the downcomer will be changed to only one 3" downcomer.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-P-00428 Line#: NA Code:
Original Specific Comment# 12

Comment: This drawing shows an outside, aboveground piping installation that will be exposed to weather. The piping installation has small-diameter piping that may freeze during a power outage when the heat tracing is off. Similar installations are generally installed in underground vaults where they are protected from the elements. An explanation of why the system is outdoors and how it will be protected from freezing in case of a power

outage should be provided. This drawing also indicates that the well casing is to be installed "by others," but it is not clear if the well screen is "by others." The drawing should be corrected to indicate who will supply and install the well screen.

Response: During an extended power outage, operators will drain the above ground lines to prevent freeze damage. Site experience has proven that below grade installations are much harder to maintain and operate due to access requirements and accessibility. The well screen will be installed by others and the drawing will be revised to clarify that information.

Action: The drawing will be revised to clarify that the well screen is by others.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-P-00453 Line#: NA Code:
Original Specific Comment# 13

Comment: This drawing shows a check valve in each of the pipelines. it is not clear why a check valve is needed in each of these lines. Drawing No. 95X-5900-N-00448 indicates that a check valve is located in each of the well pump discharges; therefore, the check valves in the valve house are apparently redundant. Also, the need for Valves No. V218 and V219 should be explained. Usually only one valve on each side of the meter is required for maintenance. Finally, it is not clear why a heated building will house these two meters. The building should house the injection water pumps instead, and the meters and valves could be installed in an underground vault. The drawings should be revised accordingly.

Response: Yes, the check valves are redundant, but our experience in operating the existing recovery well field has shown that check valves fail and the added protection the second valve gives is worth the additional cost. The check valve on existing recovery well, RW#1, failed and caused pump, screen and well damage. We have since installed redundant check valves on all of the recovery wells. Valves V218 and V219 provide isolation capability for maintenance on the meters, FCV, ARV, etc. without shutdown of both extraction wells. Site experience has proven that below grade installations are much harder to maintain and operate due to access requirements and accessibility. This coupled with the necessary security for an offsite installation is what determined the use of a building.

Action: No action required.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-P-00454 Line#: NA Code:
Original Specific Comment# 14

Comment: This drawing shows double valving on a sampling line. It is not clear why the second valve is needed.

Response: In any frequently operated penetration which requires the throttling of flow, it is prudent to place two valves in series. The first valve is used as the isolation valve with the second valve used for throttling of flow when sampling. This strategy prevents seat degradation on the isolation valve. Also, this is a standard detail for a sampling station at the site and is also used by other industries , such as Union Carbide.

Action: No action required.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95-X-5900-P-00423 Line#: NA Code:
Original Specific Comment# 15

Comment: Detail No. 4 on this drawing shows a plate strainer which is shown installed on the injection water supply pump suction shown as Drawing No. 95X-5900-P-00420. This type of strainer will reduce the 6-inch pump suction cross-sectional area by approximately 60 percent, thereby increasing the velocity and the suction head loss by an order of magnitude. The suction head will continue to increase as this strainer becomes clogged. If a strainer is required, an automatically cleaned type strainer should be used on the

discharge side of the injection water supply pumps. The design should be reviewed and the drawing revised accordingly.

Response: The plate strainer is a temporary strainer intended for initial startup to prevent possible pump damage due to construction debris. This strainer will be removed after startup.

Action: A note will be added to drawing 95X-5900-P-00423 to indicate that the strainer is to be removed after startup.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-E-00455 Line#: NA Code:
Original Specific Comment# 16

Comment: According to this drawing, five distribution panels are labeled DP-1. Each distribution panel should have a separate number. Also, each of the DP-1 panels shows circuits for heat tracing; however, no heat tracing is shown in the drawings. The drawings should indicate where the heat tracing is used and from which circuit. This drawing should be corrected accordingly.

Response: **The panels are all designated DP-1 because they are all in separate areas (450 to 600 feet apart) with power service from separate sources. When given a work assignment the electrician is given the well number and the panel designation, i.e. Well No. 11, Panel DP-1. Also, the panels are given discrete "MMICS" identification numbers by the site wide Maintenance Management Inventory Control System.** The heat trace is performance specified and detailed design will be provided by the construction contractor. The P&IDs provide definition of the lines which require heat tracing.

Action: No action required.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: 95X-5900-E-00456 Line#: NA Code:
Original Specific Comment# 17

Comment: This drawing also shows distribution panels labeled DP-1. Each distribution panel should have a separate numbers. Also, the single-line diagram for this distribution panel shows a 30A breaker for the 5-kilowatt (kW) heater. This breaker size appears to be too small. Typically, a breaker for a 5kW heater should be 50A. The breaker size should be verified and the drawing should be revised, if necessary.

Response: See specific comment 16 response. The 30 A breaker for the 5 kW heater is correct. The breaker is a 2 pole breaker connected for service at 240 V as is indicated by the drawing. 5 kW at 240 V draws 20.8 A for unity power factor and 100% efficiency. Since heaters have power factor and efficiencies just below these, they would draw slightly more. If the heater were served at 120 V, then 50 A would have been a reasonable choice.

Action: No action required.